Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Claims 2-16, 17-19, and 21 are amended.

Listing of Claims:

1. (Original) Device for producing a radioisotope of interest from a target fluid irradiated with a beam of accelerated charged particles, said device comprising in a circulation circuit (17):

- an irradiation cell (1) comprising a metallic insert (2) able to form a cavity (8) designed to house the target fluid and closed by an irradiation window (7), said cavity (8) comprising at least one inlet (4) and at least one outlet (5);
- a pump (16) for circulating the target fluid inside the circulation circuit (17);
- an external heat exchanger (15);

said pump (16) and said external heat exchanger (15) forming external cooling means of said target fluid;

said device being characterized in that it further comprises pressurizing means (14) of said circulation circuit (17) and the external cooling means of said target fluid are arranged in such a way that the target fluid remains inside the cavity (8) essentially in the liquid state during the irradiation.

2. (Currently Amended) The device according to claim 1, ~~characterised in that~~ wherein said pump (16) generates a flow rate sufficient to keep the target fluid at a mean temperature below 130°C.

3. (Currently Amended) The device according to claim 1 ~~or 2, characterised in that~~ wherein said pump (16) generates a flow rate greater than 200 ml/minute.

4. (Currently Amended) The device according to ~~any one of the preceding claims, characterised in that~~ claim 1, wherein said pump generates a flow rate greater than 500 ml/minute, preferably greater than 1000 ml/minute, and more preferably greater than 1500 ml/minute.

5. (Currently Amended) The device according to ~~any one of the preceding claims, characterised in that~~ claim 1, wherein said cavity (8) is able to contain a volume of target fluid of between 0.2 and 5.0 ml.

6. (Currently Amended) The device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein it is configured so as to contain in its circulation circuit (17) an overall volume of the target fluid that is less than 20 ml.

7. (Currently Amended) The device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein the inlet (4) and outlet (5) are arranged in such a way as to create a vortex in the flow of the target fluid inside said cavity (8).

8. (Currently Amended) The device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein one of the inlet (4) or the outlet (5) is positioned essentially tangentially to said cavity (8).

9. (Currently Amended) The device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein the inlet and the outlet are located at the lateral surface of the cavity (8), on the same meridian.

10. (Currently Amended) The device according to ~~any one of claims 1 to 9, characterized in that~~ claim 1, wherein the inlet (4) is arranged so that the target fluid inflow is directed at a impact point of the accelerated charged particle beam in the cavity window (7) in such a manner that said inflow hits said window head-on with said beam.

11. (Currently Amended) The device according to ~~any one of claims 1 to 10, characterized in that~~ claim 1, wherein the cavity (8) presents a central axis (x-x) around which a lateral surface is developed, the outlet (5) being connected to said lateral surface and the inlet (4) being along said central axis.

12. (Currently Amended) The device according to ~~any one of the preceding claims, characterized in that~~ claim1, wherein said irradiation cell (1) comprises internal cooling means.

13. (Currently Amended) The device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein said internal cooling means are in the form of a double-walled jacket surrounding said cavity (8).

14. (Currently Amended) The device according to ~~claim 12 or 13, characterized in that~~ claim 12, wherein said internal cooling means are indirect cooling means of the cavity (8).

15. (Currently Amended) The device according to ~~any one of the preceding claims, characterized in that~~ claim 1, wherein it comprises Helium-based cooling means for cooling the irradiation window (7) of the irradiation cell (1).

16. (Currently Amended) A method for producing a radioisotope of interest from a target fluid used as precursor of said radioisotope of interest irradiated inside an irradiation cell with a beam of accelerated charged particles, said irradiation cell (1) comprising an metallic insert (2), able to form a cavity (8) designed to house the target fluid and closed by an irradiation window (7), said cavity (8) being provided with at least one inlet (4) and at least one outlet (5); ~~said method being characterized in that~~ wherein said target fluid circulates inside in a circulation circuit (17) which comprises in addition to the irradiation cell (1), at least a pump (16) for the circulation of the material and an external heat exchanger (15); ~~said method being further characterized in that~~ wherein the pressure of the circuit is controlled by means of a pressurizing means (14) of said circulation circuit and in that said pump (16) and said external heat exchanger (15) are arranged in such a way that the target fluid remains inside the cavity (8) essentially in the liquid state during the irradiation.

17. (Currently Amended) The method according to claim 16, ~~characterized in that~~ wherein a vortex in the flow of the target fluid is induced inside said cavity (8).

18. (Currently Amended) The method according to ~~claim 16 or 17, characterized in that~~ claim 16, wherein the pump (16) generates a flow rate sufficient to keep the target fluid at a mean temperature below 130°C.

19. (Currently Amended) The method according to claim 18, ~~characterised in that~~ wherein the pump (16) generates a flow rate greater than 200 ml/minute.

20. (Original) An irradiation cell (1) comprising a metallic insert (2), able to form a cavity (8) designed to house a target fluid and comprising at least one inlet (4) and at least one outlet (5), said cavity (8) being defined by a central axis around which a lateral surface is developed, and said cavity (8) being closed by an irradiation window (7) and being closed by a second surface essentially perpendicular to the central axis and opposed to the irradiation window (7), said irradiation cell being characterized in that the inlet is connected to said second surface essentially perpendicular to said central axis, while the outlet is connected to the lateral surface.

21. (Currently Amended) Use of the device according to claim 1, ~~any one of the claims 1 to 15 or of the method according to any one of the claims 16 to 19 or the irradiation cell according to claim 20~~ for manufacturing a radiopharmaceutical compound, in particular devoted to medical applications such as positron emission tomography.